MONTHLY WEATHER REVIEW.

(GENERAL WEATHER SERVICE OF THE UNITED STATES.)

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WAR DEPARTMENT,

OFFICE OF THE CHIEF SIGNAL OFFICER,

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

INTRODUCTION.

In preparing this REVIEW the following data, received up to February 20th, have been used, viz: the regular tri-daily weather charts, containing the data of simultaneous observations taken at 135 Signal Service stations and 13 Canadian stations, as telegraphed to this office; 164 monthly journals and 165 monthly means from the former, and 13 monthly means from the latter; 216 monthly registers from Voluntary Observers; 60 monthly registers from United States Army Post Surgeons; Marine Records; International Simultaneous Observations; Marine Reports through the co-operation of the New York Herald Weather Service; abstracts of Ships' Logs, furnished by the publishers of the New York Maritime Register; monthly reports from the local Weather Services of Iowa, Nebraska and Missouri, and of the Central Pacific Railway Company; reliable newspaper extracts; special reports.

BAROMETRIC PRESSURE.

To illustrate the subject of the distribution of mean atmospheric pressure over the United States and Canada for the month of January, 1882, chart No. II has been prepared, upon which are traced the lines of equal barometric mean values. The areas of lowest mean pressure embrace the Lake Superior region and the Canadian Maritime Provinces, lowest barometers at Charlottetown, P. E. I., and Marquette, 29.92 and 30.04 respectively. In the extreme southern portion of the South Pacific Coast Region the barometric mean falls to 30.03; elsewhere throughout the entire country the mean pressure ranges from 30.07 to 30.23 The two principal areas of high pressure embrace the South Atlantic States and the Middle Plateau Region, highest barometers, 30.23, at Augusta and Charleston, and 30.21 at Pioche, Salt Lake City and Eagle Rock. By comparison with the previous month, it will be noticed that the areas of maximum pressure occupy about the same regions, the western area decreasing in extent and pressure, while that to the eastward increased in extent but diminished slightly in pressure. The low area which occupied northern Minnesota and Dakota in December last, moved gradually eastward into northern Canada, but the change was not sufficient to restore the natural condition in the former State, as at St. Vincent the barometric mean value still remained 0.06 inch below the normal.

Departures from the Normal Values for the Month.—Compared with the means of previous years, the mean pressure for the present month shows (with the exception of scattering stations) very small changes. The distribution of excess and deficiency is evenly balanced in the *number* of separate areas but not in the *extent* embraced by each. For the most part, the pressure is below the normal for the month. The larger area of excess embraces the central portion of the Lake Region and thence southeastward to the Atlantic coast, the departures ranging from 0.01 to 0.1 inch, being mostly however, from 0.02 to 0.05 inch. The second area of excess includes the Middle and Northern Pacific Coast and Northern Plateau Regions, where the departures range from 0.02 inch at Sacramento to 0.14 inch at Portland and Olympia. The most extensive area of deficiency, including the Eastern Gulf States and South Pacific Coast Region, embraces the entire country west of the Mississippi and east of the 112th meridian, the departures ranging from 0.01 to 0.1 inch. The second and smaller area of deficiency comprises the eastern portion of the Lower Lake Region, and New England north of Connecticut, departures ranging from 0.01 to 0.04 inch. Stations reporting a normal condition are as follows: Marquette, New Haven, New London, Pioche and Smithville.

Barometric Ranges.—The range of pressure for the present month has generally varied from 0.75 to 1.35 inches, and in the extremes from 0.43 inch at Key West to 1.7 inches at Barnegat. The ranges increase with the latitude throughout the entire country, and along the southern boundary of the United States, from Florida to California. Throughout the various districts the monthly barometric ranges varied as follows: New England, from 1.14 inches on Mt. Washington to 1.56 inches at Eastport and 1.63 inches at Newport; Middle Atlantic States, 1.31 inches at Lynchburg to 1.47 inches at Albany and 1.7 inches at Barnegat; South Atlantic States, 0.79 inch at Jacksonville to 1.36 inches at Kittyhawk; Florida Peninsula, 0.43 inch at Key West to 0.66 inch at Cedar Keys; Eastern Gulf States, 0.68 inch at Pensacola to 0.78 inch at Montgomery and Vicksburg; Western Gulf States, 0.63 inch at Indianola and Galveston to 0.83 inch at Little Rock and 1.03 inches at Fort Gibson; Rio Grande Valley, 0.54 inch at Brownsville to 0.65 inch at Castroville and 0.7 inch at Rio Grande; Ohio Valley and Tennessee, 0.9 inch at Memphis to 1.02 inches at Cincinnati and 1.3 inches at Pittsburg; Lower Lake Region, 1.12 inches at Detroit and Cleveland to 1.45 inches at Oswego; Upper Lake Region, 1.17 inches at Marquette to 1.25 inches at Chicago and 1.47 inches at Alpena; Upper Mississippi Valley, 1.00 inch at Cairo to 1.21 inches at Des Moines and 1.37 inches at Madison; Missouri Valley, 0.97 inch at Springfield, Mo., to 1.11 inches at Yankton and 1.17 inches at Leavenworth and Huron; Extreme Northwest, 1.17 inches at Fort Buford to 1.21 inches at Bismarck and 1.55 inches at St. Vincent; Northern Slope, 0.76 inch at Cheyenne to 1.00 inch at Fort Custer and 1.02 inches at Forts Assinnaboine and Benton; Middle Slope, 0.67 inch on Pike's Peak to 1.03 inches at Dodge City; Southern Slope, 0.56 inch at McKavett to 0.59 inch at Fort Davis and 0.98 inch at Fort Griffin; Northern Plateau, 0.74 inch at Eagle Rock to 1.00 inch at Spokane and 1.25 inches at Umatilla; Middle Plateau, 0.69 inch at Pioche to 0.79 inch at Winnemucca and 0.8 inch at Salt Lake City; Southern Plateau, 0.42 inch at Fort Grant to 0.53 inch at Prescott and 0.68 inch at Santa

Fe; North Pacific Coast Region, 0.81 inch at Roseburg to 0.97 inch at Portland and 1.18 inches at Olympia; Middle Pacific Coast Region, 0.61 inch at San Francisco to 0.67 inch at Sacramento and 0.73 inch at Red Bluff; South Pacific Coast Region, 0.66 inch at Visalia to 0.76 inch at Yuma and 0.8 inch at San Diego.

Areas of High Barometer.—Nine such areas have been sufficiently important to merit description.

No. I.—During the 1st the pressure rapidly increased over the Lake Region, Tennessee, the South Atlantic and East Gulf States. The morning map of the 2d showed a centre of high barometer near Montgomery and one in the Extreme Northwest. This increased pressure in the Gulf States extended rapidly to the northeast, following the passage of low area No. I, and on the 3d joined the northern high area, which had moved eastward. On the morning of the 4th the centre of high barometer was near Parry Sound, and during this day and the 5th passed over the St. Lawrence Valley and to the eastward over Nova Scotia. A rapid fall of temperature accompanied the rise in the barometer along the Atlantic coast on the 1st and 2d. The cold wave which accompanied the high barometer that passed from the northwest did not effect stations south of lat. 40° N. The minimum temperature for the month occurred at most stations in the South Atlantic and East Gulf States on the 2d.

No. II.—During the 6th the barometer rose rapidly in Oregon and Washington Territory. This rise extended, during the 7th, over the whole country west of the Mississippi, and on the 8th the area of highest barometer was over Colorado and Kansas; it then moved into the Ohio valley and the Lower Lake Region, and thence off to the northeast. The cold wave accompanying this area was felt on the Pacific coast on the 6th, extended to the Missouri river on the 7th, and reached the Atlantic coast on the 9th. The temperature continued to fall along the Atlantic coast during the 10th.

No. III.—Appeared in Montana on the 9th, moved to the southeast during the 10th, and on the morning of the 11th was central in Kansas; in Pennsylvania on the morning of the 12th, and passed off the Middle Atlantic coast during the day. The cold wave reached the Mississippi on the 10th. From the afternoon of the 10th to the afternoon of the 11th the temperature fell from 15° to 23° in the East Gulf States, and the morning map of the 12th showed a fall of from 13° to 24° in the Upper Lakes in last 24 hours.

No. IV.—Appeared in Washington Territory on the 12th; the increased pressure extended rapidly to the southeast. On the 13th the centre of high pressure was in Kansas, and moved during the 14th to the South Atlantic coast. The temperature fell from 8° to 27° in Dakota and Montana during the 12th; this fall of temperature was felt over the Mississippi and Missouri Valleys and West Gulf States during the 13th, and over New England, the Middle and South Atlantic States on the 14th. During the 15th the pressure fell rapidly in the Lower Lake Region and New England, and remained comparatively high in the South. The winds shifted to southerly, and the temperature rose from 10° to 20° in the Lower Lakes, in New England, the Middle, South Atlantic and Gulf States.

No. V.—The barometer rose rapidly in Montana on the 14th, and on the 15th the highest pressure was over that Territory; by the 16th it had moved into Kansas; the centre thence passed eastward to the Middle Atlantic coast and up the coast to Nova Scotia. The cold wave was felt over the whole United States. Starting in Montana on the 14th, it soon extended from British America to the Gulf of Mexico, and passed eastward, reaching the Atlantic coast on the 17th. From the morning of the 16th to the morning of the 17th the temperature fell 44° at Denison, 36° at Indianola, from 35° to 40° in the Ohio Valley and from 20° to 36° in the Middle Atlantic States, and New England on the 17th.

No. VI.—An area of high barometer that had advanced from the Northwest was found on the morning of the 19th as an area of 30.30 over Missouri, Iowa and Illinois. The centre of high pressure moved rapidly to the northeast, and on the morning of the 20th the highest pressure was over Nova Scotia. During the night of the 17th the temperature fell from 15° to 25° in Dakota and Montana, and from 6° to 14° in the Upper Lake Region the next night. No marked changes were observed in the Lower Lake Region. The cold wave reached the Atlantic coast on the afternoon and night of the 19th, causing a fall of from 10° to 20° in the Middle Atlantic and New England States, and Canadian Maritime Provinces.

No. VII.—On the morning of the 21st the highest barometer was in northwestern Dakota, where the pressure had increased from 0.68 to 0.76 inch in last twenty-four hours. On the morning of the 22d the area of highest pressure was over Manitoba; it reached the St. Lawrence Valley on the 24th, and then moved to the southeast, and on the morning of the 25th was over the New England coast. The winds shifted to the northwest in the Upper Lake Region on the 21st, the Lower Lakes and Middle Atlantic States on the 22d, and in New England on the 23d. Snow fell in the Lake Region on the 21st, 22d, and 23d. In New England and the Middle Atlantic States the weather generally cleared as soon as the wind had shifted to northwest. In its progress this area was accompanied by very low temperatures. The minimum temperatures for the month occurred at most stations in the Lake Region, New England and Middle Atlantic States on the 24th.

No. VIII.—The barometer rose from 0.38 inch to 0.46 inch in Montana on the 25th. This increased pressure extended rapidly to the south and east, and at midnight of the 26th the highest barometer was at Leavenworth. The centre of highest pressure then passed rapidly to the Lower Lake Region, and thence to the northeast over the Canadian Maritime Provinces. At midnight of the 25th the temperature had fallen from 20° to 30° in Montana in last twenty-four hours. The cold wave extended south to Mexico; it then moved eastward reaching the Atlantic coast on the 27th.

No. IX.—On the morning of the 28th an area of high barometer was central in the Upper Missouri Valley, and a marked fall in temperature occurred in the Upper Mississippi and Missouri Valleys and northwest districts. This high barometer moved down the Missouri Valley. The highest barometer was at Leavenworth on the morning of the 29th. It then moved east to the Atlantic coast, which it reached on the 30th. A marked fall in temperature was felt in all districts. As this area passed over the Upper Missouri Valley the minimum temperatures for the month occurred on the 28th.

Areas of Low Barometer.—Fourteen areas of barometric minima appeared within the limits of the Signal Service stations during the month of January, 1882. Chart No. I shows the paths of thirteen of these areas. No. VIII is not charted.

No. I.—On the 30th of December, 1881, the barometer fell rapidly in Texas. This fall extended eastward the next day, and at midnight of the 31st a storm centre was located in northeastern Georgia. The morning map of January 1st showed the centre to be near Smithville, N. C. It then passed to the northeast, accompanied by high winds, heavy rain and snow along the Atlantic coast. Snow also fell in the Lake Region. The following high velocities were noted during the passage of this storm: Hatteras, NW., 32 miles; Kittyhawk, N., 48 miles; Cape Henry, NW., 52 miles; Delaware Breakwater and Sandy Hook, N., 43 miles. The following reports furnished through the co-operation of the New York Herald Weather Service probably indicates the presence of this storm during its passage eastward over the ocean: S. S. *Assyria*, 1st, a. m., in 35° 21′ N., 66° 10′ W., 30.20, W., force 6, clear and fine; p. m., in 35° 42′ N., 67° 28′ W., 29.88, SSE., force 8, overcast and threatening. 2d, in 36° 13′ N., 68° 13′ W., 29.90, W., force 9, heavy squalls, thunder and lighting; p. m., in 36° 26′ N., 69° 07′ W., 29.90, force 8, overcast and squally, high confused sea. 3d, a. m., in 37° 32′ N., 70° 35′ W., 30.10, WNW., force 6, sea covered with driving vapour of warm water followed by squally weather and hail. S. S. *Acapulco*, 1st, in 34° N., 74° 18′ W., 29.82, a fall of 0.42 inch in past 24 hours,

WSW., force 9, heavy squalls of wind and rain. 2d, in 37° 20′ N., 73° 48′ W., 30.25, NNW., force, 6, snow squalls, heavy sea swell from northeast.

No. II.—Appeared in Texas on the 3d. It moved to the northeast with increasing pressure, during the 4th, and disappeared as a storm centre on the 5th, in Ohio. Rain fell in the Gulf States and Tennessee, and snow in the Ohio Valley and Lake Region.

Nos. III and IV.—No III appeared on the coast of Washington Ter., on the morning of the 4th. On the 5th, it was near Fort Garry, southeast to southwest winds, with cloudy weather, prevailing in the Lake Region and the Upper Mississippi and Missouri Valleys. On the 6th it rained or snowed in all districts east of the Mississippi river. On the 7th the centre passed to the east of Nova Scotia. On the morning of this day area No. IV appeared in Iowa, and the rains of the 6th continued during the 7th and 8th. This area moved north and east and disappeared over the Gulf of St. Lawrence on the afternoon of the 9th. The following reports furnished through the co-operation of the New York Herald Weather Service, probably indicates the presence of this storm during its passage eastward over the ocean: S.S. *Zeeland*, 7th, in 42° 11′ N., 61° 19′ W., 29.50, a fall of 0.65 inch in past 24 hours, variable winds; 8th, in 41° 13′ N., 64° 48′ W., 29.95, NNW., moderate gale, high westerly sea; 9th, in 40° 47′ N., 69° 46′ W., 29.62, SW., fresh gale, dense fog for seven hours. S. S. *Celtic*, in 42° 24′ N., 61° 02′ W., 29.85, a fall of 0.51 inch in past 24 hours, S., force 4, rain.

No. V.—On the morning of the 10th this area was central in Texas, accompanied by rain in the North Atlantic and Gulf States, Tennessee and the Ohio Valley. This storm moved rapidly to the Lower Lake Region and thence to the northeast. General and heavy rains in all districts east of the Mississippi, clearing in New England on the 12th, and in other districts the day before. Wind velocities of 27 to 40 miles were reported from the New England, Middle, and South Atlantic coasts. The following reports furnished through the co-operation of the New York Herald Weather Service probably indicates the presence of this storm during its passage eastward over the ocean: S. S. *City of Montreal*, 12th, in 44° 31′ N., 49° 56′ W., NW. to NE. strong gales, high head sea; 13th, in 43° 06′ N., 56° 01′ W., E. to NNW. strong gales, heavy snow squalls, high beam sea.

No. VI.—Advancing from the southwest this area was central near Leavenworth at midnight of the 12th. Rain had fallen during the day in all districts east of the Mississippi; these rains continued during the 13th. The winds had shifted to westerly and by midnight of the 14th clear weather prevailed in nearly all districts. On the afternoon of the 15th a new area (No. VIII, not charted) appeared near Leavenworth, and following after No. VI caused general and heavy rain or snow in the same districts as No. VI. The rain continued in New England, the Middle, South Atlantic, and Gulf States, Tennessee and the Ohio Valley, and Lower Lake Region until the 17th. The following reports furnished through the co-operation of the New York Herald Weather Service probably indicates the presence of this storm during its passage eastward over the oeean: S. S. *City of Montreal*, 14th, in 42° 12′ N., 61° 18′ W., NNW. to S. and NW., fresh to strong gales, high head sea; 15th, in 41° 01′ N., 65° 17′ W., WNW., heavy gale, high head sea; 16th, in 40° 40′ N., 71° 11′ W., strong westerly winds, fine weather. S. S. *Britannic*, 14th, in 42° 02′ N., 62° 42′ W., 29.13, a fall of 0.67 inch in past 24 hours, W., force 6; 15th, in 40° 46′ N., 69° W., 29.91, WSW., force 3.

No. VII.—This area could only be approximately traced, as its path was north of our stations of observation; it was of slight energy, and had but little effect on the weather in the United States.

No. IX.—Was central near Fort Garry on the afternoon of the 17th. During the remainder of this day and the 18th it moved eastward as far as Rockliffe, accompanied by very little rain, the winds in the Lake Region and Mississippi Valley being from southwest to northwest. A secondary depression that had moved up from the Gulf of Mexico on the 18th caused rain in the Middle and South Atlantic States and Tennessee. By the morning of the 19th this secondary depression had moved into New England and joined No. IX, which was then central in the St. Lawrence Valley, and at midnight generally fair weather prevailed. The following reports, furnished through the co-operation of the New York Herald Weather Service, probably indicates the presence of this storm during its passage eastward over the ocean: S. S. *Adriatic*, 19th, in 43° 04′ N., 57° 55′ W., north to variable, fresh gales, snow squalls; 20th, in 41° 30′ N., 64° 34′ W., variable winds, squally with hail. S. S. *Waesland*, 19th, in 42° 28′ N., 60° 05′ W., 29.94, a fall of 0.18 inch in past 24 hours, NW. to S., strong winds with thick weather; 20th, in 41° 01′ N., 65° 11′ W., 30.28, SW. to NE., first part of day stormy with very high sea, followed during afternoon by pleasant weather.

No. X.—Appeared in the Extreme Northwest on the morning of the 20th. On the morning of the 21st the centre was near Marquette, and snow had fallen in the Lake Region. During this day and the 22d it moved east and north to the St. Lawrence Valley, accompanied by snow. The weather generally cleared on the 23d. The following reports furnished through the co-operation of the New York Herald Weather Service probably indicates the presence of this storm during its passage eastward over the ocean: S. S. *Lake Champlain*, 22d, noon, in 43° 30′ N., 55° 49′ W., 29.38, a fall of 1.00 inch in past 24 hours, SSW., force 4, heavy southerly sea; midnight, barometer 29.40, wind SW, force 9. 23d, noon, in 42° 57′ N., 58° 47′ W., 29.40, W., force 9, high confused sea; midnight, 29.77, W., force 10. 24th, noon, in 42° 18′ N., 61° 09′ W., 30.00, WNW., force 9; midnight, 30.40, NW., force 5. S.S. *Bothnia*, in 43° 04′ N., 54° 50′ W., 29.56, a fall of 0.80 inch in past 24 hours, S., force 6, thick misty weather. 23d, in 42° 04′ N., 59° 38′ W., 29.57, W., force 11, (violent hurricane) very high westerly sea, dark cloudy sky with heavy hail squalls. 24th, in 41° 10′ N., 63° 25′ W., 30.14, NW., force 8, very high sea, cloudy with constant snow squalls. 25th, in 40° 42′ N., 68° W., 30.50, W., force 3, fine clear weather.

Nos. XI and XII.—No. XI appeared in Montana on the 24th. Rain and snow fell in the Upper Mississippi and Missouri Valleys and the Extreme Northwest on this day. On the 25th the centre moved into the Lake Region and general and heavy rains occurred in all districts east of the Mississippi. The centre passed over New Brunswick on the 26th. On the morning of this day when the centre was near Rockcliffe, No. XII appeared central in Iowa, and moved across the Lake Region and into the Province of Ontario. The rains which began with No. XI, continued during the passage of this storm on the 26th. The following reports furnished through the co-operation of the New York Herald Weather Service probably indicate the presence of this storm during its passage eastward over the ocean: *S. S. Republic*, 29th, in 49° 34′ N., 37° 55′ W., 28.89, a fall of 1.17 inches in past 24 hours, SSW., force 7; 30th, in 48° 15′ N., 42° 54′ W., 29.22, SSE., force 6, sleeting; 31st, in 46° 33′ N., 47° 31′ W., 29.59, WSW., force 7, hazy.

No. XIII.—The centre of this area was first located near Duluth, on the midnight map of the 27th. Cloudy weather and light rain in the Lake Region, and general rains and snow in New England prevailed on the 28th. By the morning of the 29th the winds had shifted to west and northwest. Snow fell during the day in New England and the Lower Lake Region; weather generally clearing by midnight.

No. XIV.—This storm moved up from the Gulf of Mexico on the 30th, causing heavy rains in the South Atlantic and Gulf States during the day. On the morning of the 31st it appeared as an area of low barometer, central in Kentucky and snow had fallen in the Middle Atlantic States; this snow continued and extended to New England on the 31st; the weather cleared in the South Atlantic and Gulf States on this date. Cautionary signals were ordered for this storm on the morning of the

31st and were justified by the following maximum velocities: Hatteras, SW., 42 miles; Kittyhawk, S., 36 miles; Cape Henry, E., 36 miles; Delaware Breakwater, E., 40 miles; Sandy Hook, E., 54 miles, New York, NE., 41 miles; Eastport, NE., 38 miles; and by velocities of more than 25 miles at a large number of other stations on the coast. The following reports furnished through the co-operation of the New York Herald Weather Service probably indicate the presence of this storm during its passage eastward over the ocean: *S. S Wyoming*, 30th, in 44° 44′ N., 54° W., SE. to NW., moderate breeze to hard gale, with frequent snow squalls; 31st, in 43° 12 N., 57° 33′ W., NW., fresh to strong gale and squally, high sea; Feb. 1st., in 42°, N., 63° 35′ W., SE. to NW., strong gales, cloudy with heavy rain; 2d, in 40° 38′ N., 69° 37′ W., N. to W., heavy gale, with moderate breeze, fine weather.

INTERNATIONAL METEOROLOGY.

International charts Nos. IV and V accompany the present REVIEW for January, 1882. The former is published for November, 1879, and continues the series of this chart commenced in January, 1877. The "Beobachtungen auf dem Nordatlantischen Ocean" kindly furnished this office through the courtesy of Prof. Dr. G. Neumayer, Director of the German Marine Observatory, has not been used in the preparation of chart No. IV, owing to unavoidable delay in the receipt of the data. Chart No. V is prepared for the month of February, 1880, and continues the series of this chart commenced in November, 1877.

Chart No. IV shows the mean pressure, temperature and prevailing direction of the wind at 7.35 a. m., Washington, or 0.43 p. m., Greenwich mean time, for the month of November, 1879, over the Northern, and at certain isolated stations in the Southern Hemisphere. There are no marked centres of barometric minima for the present month, owing to a more uniform distribution of mean atmospheric pressure, particularly over the land areas. Three areas of comparatively low pressure are distributed as follows: one between the Azores and Maderia Islands, barometer 29.90; another over the Okhotsk Sea, barometer 29.90, and the last central over Greenland, the isobar of 29.80 passing thence northeastward north of parallel 70° N. to northern Scandinavia and Lapland. The continued progress of areas of high pressure from the region of the Azores northeastward over northern Europe effected a very marked change in the distribution of mean atmospheric pressure off the western coast of that country. The unvarying conditions of the past six months or more have finally been reversed by the formation of an area of barometric maxima over the British Isles and one of barometric minima over the Azores. There are four principal areas of high pressure for the month distributed as follows: in central Mexico, 30.30; off the western coast of Ireland, 30.30; in southeastern Siberia, 30.30; in the southeastern portion of the United States, 30.20. The extreme mean pressures for the month are, 29.71 (lowest) at Gothaab and 30.34 (highest) at Mexico. The extreme monthly range of mean pressure is 0.63 inch, which is 0.63 inch smaller than the range for November, 1877, and 0.68 inch smaller than for the same month in 1878. The following extreme monthly mean temperatures are given in Fahrenheit's scale: *Lowest*, York Factory, 3°; Nertchinsk, 8°; Yeniseisk, 9°; Nikolaievsk, on the Amoor, 13°; Archangel and Barnaul, 14°; Fort Garry and Haparanda, 15°; Moose Factory, 18°; Ekaterinburg, 19°: *Highest*, Free Town, 86°; Paramaribo, 83°; Manilla, 81°; Bridgetown, 80°; Poona, 79°; Bombay, Fort de France, Mauritius, and St. Thomas, 78°; Nassau and Santiago de Cuba, 76°; Havana, 75°. The prevailing direction of the winds over the United States, was *northeast* to *northwest* in the Atlantic coast States; *southerly* in the Gulf States, Ohio Valley and Tennessee; *southwest* to *northwest* in the Lake Region; *northwesterly* in the Upper Mississippi and Missouri Valleys and Northwest; *variable* in the Plateau and Pacific Coast Regions. Over Canada and in the Maritime Provinces, *north* to *west*. In central Mexico, *calms*. Over the Atlantic Ocean, *northeasterly* from the European coast westward to near 40° W. and from the American coast eastward to same parallel, *northeast* to *northwest* and *southwest*. In Europe, *northeast* to *northwest*, except *southerly* along the Norway coast and in central Russia. In Algiers, *northeast* to *northwest*. In Hindostan, *northerly*. Along the Asiatic coast and over the Japan Islands, *northeasterly*. Compared with November, 1877 and 1878, the temperature over the United States is generally lower except in the Gulf and South Atlantic States where the isotherm of 60° nearly replaces that of 50° in the two previous years. In barometer there is a marked rise in the Gulf and South Atlantic States, an area of 30.20 replacing that of 30.10; elsewhere there is but little change. Over the Atlantic the change in pressure is a very marked one, particularly in that region included between the parallels of 45° and 65° N. and the meridians of 10° and 35° W. where, as compared with November, 1877, the isobar of 30.30 replaces that of 29.40, and as compared with November, 1878, it replaces that of 29.90. In the region of the Azores there is a decided fall, amounting to over 0.2 inch, while off the American coast in the vicinity of 35° N., 70° W. a very noticeable rise occurs. With respect to temperature there is a general rise north of parallel 40°, increasing slightly with the latitude; elsewhere the changes are unimportant. In the various countries of Europe and Asia, the following changes appear: British Isles, temperature slightly lower and the pressure from 0.45 to 0.73 inch higher. Scandinavia and Denmark, temperature from 5° to 12° lower and the pressure from 0.20 to 0.35 inch higher. France, temperature from 1° to 7° lower and the pressure from 0.28 to 0.33 inch higher. Germany, temperature from 5° to 7° lower and the pressure from 0.20 to 0.25 inch higher. Austria, temperature from 7° to 14° lower and the pressure from 0.05 to 0.07 inch higher. Spain and Portugal, temperature from 4° to 6° higher with an increase in pressure of from 0.01 to 0.04 inch. Italy, temperature from 1° to 3° lower and the pressure from 0.01 to 0.07 inch higher. Algeria, temperature from 1° to 7° higher with an increase in pressure of 0.05 to 0.12 inch. Turkey, temperature slightly higher and the pressure from 0.01 to 0.05 inch lower. British India, temperature from 1° to 4° lower while the pressure shows little or no change. Russia and Siberia, temperature from 1° to 5° lower and the pressure from 0.01 to 0.04 inch higher. The accompanying table shows the deviations in temperature and barometer at isolated stations for the month of November, 1879, as compared with the means of the past two years:

Comparative Thermometric and Barometric Means, with corresponding Departures.

STATION.	Mean Temperature.			Mean Barometer.		
	Nov., 1877-78.	Nov., 1879.	Departure.	Nov., 1877-78.	Nov., 1879.	Departure.
	°	°	°			
York Factory	15.9	2.8	+12.1	29.65	30.11	+0.16
Gedthaab	28.0	26.8	— 1.2	29.73	29.71	—0.02
Stykkisholm	31.0	37.0	+ 6.0	29.68	29.96	+0.28
Tromso	32.2	28.9	— 3.3	29.51	29.76	+0.25
Thorshavn	39.4	41.5	+ 2.1	29.55	30.13	+0.58
Archangel	31.3	14.0	—17.3	29.76	29.84	+0.08
Ekaterinburg	29.1	19.0	—10.1	30.18	30.02	—0.16
Barnaul	21.0	14.4	— 6.6	30.36	30.22	—0.14
Yeniseisk	11.3	9.3	— 2.0	30.31	30.19	—0.12
Nikolaievsk on the Amoor	8.9	13.3	+ 4.4			
Zi-Ka-Wei	58.6	52.3	— 6.3	30.32	30.23	—0.09
Tokei	47.6	46.8	— 0.8	30.12	30.10	—0.02
Pekin	35.3	38.7	+ 3.4	30.32	30.27	—0.05
Tashkend	40.9	44.4	+ 3.5	30.46	30.24	—0.22
Nukuss	41.7	42.8	+ 1.1	30.29	30.19	—0.10
Beirut	73.4	70.3	— 3.1	30.04	30.04	Normal
Mauritius	78.2	77.9	+ 0.3	30.02	30.05	+0.03
Fort Napier	77.2	77.1	— 0.1	29.81	29.78	—0.03
Cape Town	72.9	72.6	— 0.3	30.02	30.01	—0.01
Free Town	85.9	86.4	+ 0.5	29.93	29.94	+0.01
Paramaribo	83.1	82.8	— 0.3	29.97	29.95	—0.02
Funchal	70.1	69.6	— 0.5	30.09	29.88	—0.21
Penta Delgado	65.3	65.1	— 0.2	30.14	29.91	—0.23
Angra	62.3	62.6	+ 0.3	30.14	29.91	—0.23
Bridgetown	81.6	80.2	— 1.4	29.91	29.91	Normal
Navassa	81.5	79.7	— 1.8	29.92	29.91	—0.01
Medellin	66.3	65.4	— 0.9			
San Jose de Costa Rica	64.2	66.6	+ 2.3			